Building of Canal Comparatively Easy for American Engineers.

THE SOFT SOIL TO DIG IN

The Locks Are Only Serious Problems That Confront Constructors of the Canal.

BY, MERRILL A. TEAGUE. (Special Cor. spendence of The Times-Dispatch.)

COLON, R. P., Dec. 29.-There is nothing in the nature of the work which has to be done on the Isthmus before the ship canal can be opened to navigation to daunt an American. I have made three excursions over the canal route, taking in the sea level sections at either end and the middle portion, which runs through dry cutting, and, while I do not pretend to speak expertly of the engineering aspects of the problem, I should say that the building of the canal will be a comparatively easy task for knowing, enterprising and energetic Americans. That Americans have undertaken and That Americans have undertaken and successfully concluded projects presenting vastly greater engineering complexities is indisputable. As a problem in casing insering science the New York subway system dwarfs the canal scheme into insignificance. So does the plan of the Pennsylvania Railroad to tunnel tile North River and construct in the very heart of New York city a great subterranean tunnel. On some of our western railroads—notably on the line which runs over Marshall Pass, in Southwestern Colorada—intinitely more intricate problems were successfully solved at a time when engineering science was not nearly as exact as it is to-day, and from the engineering, as well as from the financial point of view, New York State is to-day dealing with a project—the enlargement of the Erie Canal—which deserves to stand on a plane with that one which centers here. successfully concluded projects present

centors here.

As I remarked in a previous letter, the activity of the American engineers who have dealt with this problem with a view to its solution by the United States has been in the direction of simplification. Great success has attended their efforts. In our scenme we have gone had strides ahead of anything the Freezen in their final plans, contemple strides ahead of anything the French, even in their final plans, contemplated. Instead of a canal with five locks and six levels, we shall build a waterway with two sets of locks, a tide gate and three levels. Instead of a complicated arrangement for controlling the torrential flow of the Chagres River, with auxiliary canals and storage reservoirs to provide water for certain of the levels, our plan is to build one monster dam and then let the natural swamps take care of the Chagres.

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THE AMERICAN PLAN.

Should we build this canal-and nearly every Isthmian will die of disappointment should we flunk on the project which incubated this baby republic—there will be a sea level section 500 feet wide on the surface, 150 feet wide on the bottom and deep enough to gafely accommodate vessels drawing 35 feet of water, extending from the entrance back of Cristobal Colon Point, the northern terminus, to Bohio, a distance of 14 miles. In this section we will utilize the bed of the Chagres River at certain points, and the entire section can be constructed by the dredging process. This section is now open for its entire length to very light draft vessels, and the soil underlying it is soft mud and still softer alluvial deposit, so that the dredges can work steadily and without encountering any serious obstruction. One problem alone presents liself on this portion of the work, and the French partially solved that. We shall have to make effective the plan to divert the current of the Mindi and Gatun Rivers. The French construct of the diversion canal; it remains for us to put it to practical use by making it carry the water of these rivers. This done—and the doing of it will be a simple matter—there will be no difficulty encountered beyond that of preventing sit deposits that might obstruct the channel. This latter will entail constant dredging, an item which will come within the annual cost of maintenance and to which engineers are now paying no attention. engineers are now paying no attention.

THE GREAT BONGO MAN.

The plan for the Bohlo dam will, beside greatly simplifying the whole canal project, minimize the amount of work that will annually be required to keep the sea level section from being filled up the sea level section from the section from the sea level section from the se sea level section from being filled up by the action of the water washing con-stantly against soft, yielding mud banks, for this dam will restrict the current in the Chagres River until it will be no more formidable than is the tide at Colon, which rises only 18 inches. The dam at Bohio will be one of the largest ever constructed. It will extend in an easterly and westerly direction for a dis-tance of 1,286 feet, and it will be 300 feet wide on the bettom, narrowing to about easterly and westerly direction for a dis-tance of 1,286 feet, and it will be 300 feet wide on the bottom, narrowing to about 25 feet on the top, which will be about 75 feet above the level of the Chagres River. The only problem now bothering en-gineers who have given careful attention to the canal plans is in relation to this

dam.

The French, in prospecting the country about Bohio to secure a suitable location for the dam, did their work in a shift-less manner. Their borings were wholly inadequate, and Americans have not gone sufficiently into the matter to have bettered to any appreciable extent what the French did. As investigation on this particular detail now stands, it will be necessary to sink caissons to a depth of 128 feet in order to secure a suitable foundation for the dam. This depth is greater than has yet been reached by the pneumatic process—the only available one—of constructing foundations, the nearest approach to it having been a depth of 115 feet, to which the caissons for the new Williamsburg Bridge across the East River, at New York, were sunk. Caisson work is deadly in its character, and, while the engineers are confident that the calesons at Bohio can be sunk 121 feet, if necessary, they are equally confident that a secure foundation can The French, in prospecting the country



To prevent HOSTETTERS COIds, Chiles or Malaria,

# DIFFICULT TRAGLE'S GREAT SALE! "CROWDED TO THE DOORS." --- Owing to the large crowds all of last week, we will continue our "SEVENTH ANNIVERSARY SALE" all of next week. Sale to close Saturday, January

30th, 11:30 o'clock P. M. Remember, this is your last chance to get Medicines and Toilet Articles lower than any time in our history. Call and see how the TRAGLE System the most up-to-date "Drug House" in the South—are doing business. Remember, during this sale we will not sell more than two (2) articles of each kind to a Customer.

MEDICINE DEPARTMENT.	MEDICINE DEPARTMENT.
MEDICINE DEPARTMENT.  1 Munyon's Paw-Paw	ti Red Seal Sarsaparilla, the best for blood, rheumatism, ca- tairh, kidney and liver trou- ble; one bottle to each cus- tomer
5c Juniper Tar.  On Tragle's Headache Tablets (no cure, no pay)	tion
10 Dr. Shoop's Restorative	25c Red Cross Ridney Plant. 16%0 25c Pinkham's Sanative Wash. 16%0 25c Morse's Indian Root Pills 17c
One Pound 20-Mule Team Borrax (original package), per pound 20-Mule Team Borrax (original package), per 12346. See Samily Physician 17466. Angler's Petroleum Emulation 3546	kidney remedy made. 63e 25c Virginia Worm Killer, best ever made for children and adults
5c Family Physician	TOILET GOODS DEPARTMENT.
The stales Cod Liver	10c Block Pumice Stone 4c
Oll 19e	Comb
So Vapor Cresoline 360	Comb
Sc Carbolic Salve 10e	Comb 9e

### DOUBLE EXTRA SPECIALS. 15c Box Good Tooth Pow-

## Jeffy Vasement Valent Tipe Bottles Florida Water 7/20 25c Comfort Foot Powder 7c 25c Lightning Rat Killer 7c 25c Strengthening Porous Plasters 64c Rubber Finger Stalls 24c PERFUME DEPARTMENT.

PERFUME DEPARTMENT.	COFFEE AND TEA DEPARTMENT,
Violets of Virginia, the most lasting perfume on the mar- ket; used by people of refine- ment for over ten years; one drop equal to ten drops of the ordinary kind (only two ounces to each oustomer), per ounce, including bottle	fee: a regular 35c. coffee; makes a delightful cup; only one pound to each customer 10e 75c Gray's Coffee, two and a half pounds in air-tight tin cans  SOAP DEPARTMENT.
15- Tilea's Best Cologne per hot-	
LIB	tile Soap
25c Good Perfume, in fancy box, 7c	25c Packer's Tar Soap 141/20
15c Good Perfume, on fancy card	15c Pear's Unscented Soap 91/2c 5c Pure Palm Soap, 2c per cake; per dozen (only one dozen to a customer) 22c
60c Wordworth's Blue Lilles, per ounce	odown
\$1 Roger and Gallet Vera Vio- lette, per ounce: 550	10c Cosmo Buttermilk Soap 51/20
TRUSS AND BELT DEPARTMENT.	per cake: per dozen
INUSS AND DELI DEPARTMENT	15c Munyon's Witch Hazel Soap, 9e Zic Williams's Shaving Stick 17/20
\$20 Electric Belts	LA THORY HORD
\$10 Electric Belts	25c Cuticle Skin Soap 9c
\$2.50 Elastic Trusses, all sizes \$1.19	be Imported Castile Soap, Be

	THE REPORT OF THE PARTY OF THE
TOILET GCODS DEPARTMENT.  25c Rubifoam	RUBBER (OODS DEPARTMENT, 75c Female Build Syringe, 26c \$1 Two-quart Fountain Syringe, pure rubber, three pipes (only one to each elistomer) 37c 50c Atomizer, for medichal or tollet use (one to a customer) 20e
250 Holmes's Frostilla	50c Rubber Complexion Brushes, 29c 50c Rubber Spenges,
TOILET GOODS DEPARTMENT.  Zhe Bozodont	100 1,000 Sheets Tollet Paper.  50 Hest Black Ink.  25c Coleman Mustard.  50c Very Best Double Distilled  Witch Hazel, only one quart to each customer (bring bot- tie), per quart.  25c Best Quality Lemon, Vanil- la, Paregoric, Nitre, Pepper- mint and Jamalca Ginger.  10c Powder Puff.  7c 10c Royal Glue.  17c 15c Chamols Skins.  17c 15c Best and Cleanest Bird Seed, with Cuttle Bone.  17c 17c 17c 17c 17c 17c 17c 17c 17c 17
imported	Vanilla 10c Diamond Dyes, all colors. 10c Bath Tablets, per bottle. 1742 10c Beth Tablets, per bottle. 1742 15c Eye Shades. 16c Eye Shades. 17c 15c Eye Shades. 17c 16c Eye Shades. 17c 16c Mustard Plasters (ten in the box), per box. 1746 1746 1746 1746 1746 1746 1746 1746

## TRAGLE CUT-RATE DRUG STORE, 817 East Broad Street.

be found at a shorter distance down. To find that foundation either north or south of the present proposed location for the dam will be one of the first things, to which the Americans will address themselves upon undertaking the construction of the canal.

PURPOSES OF THE DAM.

Should it be discovered that the caissons will not have to be sunk 126 feet, and an extensive system of boring will decide the question, the cost, as well as the time required to complete the dam, will be greatly minimized. The dam must be built, however, no matter to what depth the caissons have to go, for in building it there will be solved the problem of the Chargres River, which is the key to the whole Panama. Canal problem. The dam, when completed, will call into existence Lake Bohlo, an artificial body of water whose bottom will be about 26 feet above sea fevel, and whose area will be approximately 14,000 acres. The Chagres River will enter this body of water from the east, bringing to it the surface flow

French, entirely obviate the necessity of constructing, at enormous cost, the auxiliary canal to tap the Chagres River at Alhejuela, and of storage reservoirs to furnish water for those levels will be only the one of Lake Bohlo, into which the natural and extraordinary currents of the Chagres can discharge without restriction, to less themselves through the case and spill ways when they become too great for the capacity of the lake.

Another immense advantage secured

the capacity of the lake.

Another immense advantage secured by the creation of this lake will be the submersion of virtually all the fever-breeding spots on the isthmian interior between Colon and Panama, for with the lake in existence the canal will touch infectious country only on the sea-level sections, in neither of which it is expected ships will ever have to tarry.

THE LOCKS OF BOHIO. THE LOCKS OF BOHIO.

For these enormously valuable advan-tages we pay an engineering fee of only one minor problem. That deals with

mit of the depression in the Cordilleras Mountains where the line of the canal crosses was 363 feet above the sea. To bring this summit level down to 50 feet, according to present pans, is the undertaking before the Americans.

The French have already cut it down to about 160 feet, so that it remains for us to excavate a further depression of 100 feet before we shall have broken the 1sthmian backbone and made at possible for ships to sail from, odden to ocean over a distance of drily 17 miles. In their busiest days the French worked thousands of men on this cut. They have there now a plan of great magnitude, consisting of hundreds of small locomotives for hauling trains of dumping cars, of which there are thousands; construction railroads built on many different levels on either side of the mountain which is to be cleft; steam shovels, drills, loading apparatus, fully equipped cable ways and all the other appliances of a gigantic excavating undertaking. dertaking

The construction railroads run

General View of the Great Culebra Cut, Looking North Toward Emperador.

from nearly 500 square miles to high ground that the river drains. During the rainy season the Chagres rises with almost incredible rapidity and to an enormous height. To control these sudden rises there will be the area of Lake Bohlo will be 75 feet above the level of Lake rises there will be the area of Lake Bohlo amount on the north to the surface of the land many feet. In Bohlo, a monster easeway furnishing water power sufficient for the operation of the double set of locks that will be built in the dam), a smaller easeway around the locks at Pedro Miguel, and a spilling the 10 feet. To accomplish this it is proposed to have two sets of two locks at Pedro Miguel, and a spilling the 10 feet. To accomplish this it is proposed to have two sets of two locks at Pedro Miguel, and a spilling the 10 feet. To accomplish this it is proposed to have two sets of two locks at Pedro Miguel, and a spilling the 10 feet. To accomplish this it is proposed to have two sets of two locks at Pedro Miguel, and a spilling the 10 feet. To accomplish this it is proposed to have two sets of two locks each, so that vessels may simultaneously pass in either directions over the low-laying country on either side of the mountain range, and the dumpings have raised the surface of the land many feet. In an about 43,000,000 cubic meters have been removed by the French leaving about 43,000,000 cubic meters have been removed by us. Just now the French are complish this it is proposed to have two summit level at 50 feet, to be excavated by us. Just now the French are complished the locks to be built in the Bohlo dam. from nearly 600 square miles to high a tround that the river drains. During the rainy season the Chagres riese with the almost incredible rapidity and to an onormous height. To control these sance the sea, at the damping have raised the Chagres, for the sea, at the sea,

average flow of about 18 feet, ranging from 14 to 22 feet ordinarily, and reaching 26 feet with the spring tides. It becomes necessary, therefore, to introduce tidegates at Miratheres to simplify the transit of ships and to protect the Pedro Miguel dam and locks from the tidal action. NOTHING MORE SERIOUS THAN DIGGING.

or simps and to proceed the characteristics of am and locks from the tidal action. NOTHING MORE SERIOUS THAN DIGGING.

The lift at Miraflores will not be more than 18 feet at high tide, and from that point to the ocean there will be a perfect sea-level section, which has only to be dredged to the required width and depth to be ready for commercial use. On this sea-level section there is no, eighnering problem except that of keeping the channel open, the rush of the tides forming a silt-carrying, current which, will have to be guarded against. This will be done by constant dredging, just as will the similar condition on the northern end.

On this route, which has been entirely traversed in the foregoing description, the shortest radius of curvature will be about 6.500 feet, giving almost entire freedom in the handling of ships along the entire line, and reducing the problem of navigating the canal to a minimum. Through Lake Bohlo, except in the Culebra cut, it will be possible for ships to sail practically at full speed, while the great width of the canal in the sealewl sections, and its freedom from obstructions, will make possible nearly full speed in those portions. By submerging the country between the Bohlo dam and Culebra the work of excavation over a good portion of the route will be largely done away with. The lake will form a channel, it being necessary instead of cutting along the entire route, merely to take off the top of the ground at such places as present elegation will interfere with a depth of 35 feet of water.

Drilling and blasting will have to be

Drilling and blasting will have to be Drilling and blasting wis may to done under our management of the enterprise, as now, at Culebra, but overywhere else the excavation will be in soft mud or soil, so that the work of making the canal itself is reduced to a simple question of digging. Within the lake will be ample room for ships to an lake will be ample room for ships to an-chor during storms, securing all the ad-vantages of a protected harbor, and the lake itself will make it possible by dredg-ing in future years to bring the water-way along its entire route down to the sea-level, should that be deemed advis-able, without interfering with its com-

abb, without interioring with its com-mercial usage.

It is, as I said in the beginning, a pro-ject, free from any grave engineering dufficulties. The French, had they been sane and settled in their plans and honest in their execution, should have com-pleted it a decade ago. That we can complete it and open it to commerce in less than a decade scems entirely rea-sonable; that we will do so is implicitly believed by everybody on the Isthmus.

#### CONFEDERATE OCCASION. Delightful Exercises at Black-

stone Female Institute.

stone Female Institute.

BLACKSTONE, VA., Jan 23.—Dr. W.
W. Smith, of the Woman's College.
Lynchburg, delivered a lecture before
the faculty and students of the Female
institute on Tuesday night, his subject
being Lee and Jackson. The address
was earnest and elequent and was interapersed with many reminiscences of
the war of 61-5.

In addition to the address of Dr. Smith
there were recitations, solos and choruses.
Mass Brickhouse elicited the applause
of all by her recitations of "The
Swerig of Lee," and "Furl that Banner."
Miss Hayden sang delightfully the famitar solos "Buwanee River," and "My
Uld Kontucky Home," which the chorus,
under the direction of Aliss Petitylohn,
sang "Bennie Blue Fiag." "Maryland,
My-Maryland," "Dixle" and other selections. tions.

The whole closed with "America," and the expressions of appreciation from all who attended proved the evening's entertainment a grand success.

### Moss-Harman.

Moss—Harman.

(Special to The Times-Dispatch.)

TAZEWELL, VA., Jan. 23.—Mr., Jos. S.

Moss. Jr., and Miss Ollette Harman were
married Wednesday afternoon at the
bride's home on Main Street, Rev. J. N.

Harman officiating. Owing to the recent death of the bride's father, H. Bane.

Harman, the wedding was a quiet affair,
only a few relatives and invited guests

being present.

All. Moss is a son of Jos. S. Moss,
of the large hardware firm of Moss &
Greever, and is one of our most popular
young husiness men. The bride is the
youngest daugnier of the late H. Bane
Harman, and a young lady of many
victure and very popular with a wide

### Fowler's Experiences

The Advertiser Who Thought His Advertising Didn't Pay.

By NATHANIEL C. FOWLER, JR.

in a city of medium size, with extensive local trade and prosperous outlying districts dependent upon the city centre. For full ten years he had been an extensive advertiser, although he was not what I would call an advertising enthusiast. He advertised largely from a sense of duty, as conventionality, (for he was conventional as well as enterprising), prevented him from discontinuing or cutting his advertising, because others in his business continually advertised. In one of his travels he ran across a prosperous merchant who had succeeded in building up an extensive business with comparatively little newspaper advertising. He thought his eyes were opened. If this man could succeed without advertising, why couldn't he? The proposition seemed reasonable, but Blank was a man of discretion. He did not plunge. Even when he thought that the innovation would be advantageous, he hesitated. He wrote to me, giving me a very well written out resume of what he had done and proposed to do. The following is a copy of my roply just as I wrote it, save a few omissions and some slight changes, that my friend's identity may not be revealed:

My Dear Blank:

Your letter received. You have told me your story so explicitly that I think I understand the situation; and then I have been privileged to visit you so many times that I cannot very well avoid being familiar with the premises. You propose to give us newspaper advertising, and you give only two reasons for considering such an action—first, that you have a friend who has succeeded without newspaper advertising; second, that you do not after the premises. You propose to give us newspaper advertising, and you give only two reasons for considering such an action—first, that you have a friend who has succeeded without newspaper advertising; second, that you do not

such an action-frst, that you have a friend who has succeeded without news-paper advertising; second, that you do not

friend who has succeeded without nowspapers paper advertising; second, that you do not think that you have tangible proof that your advertising has paid.

I will not consider your friend's case any more than to say that exceptions always have occurred, are occurring, and always will occur. There are men who can succeed by practically opposing fundamental principles of trade, but these men are excoptions to the rule of some as well as the rule of business. The law of average is safer to follow than the rule of exception. You have absolutely no evidence to support your claim that your advertising may not have paid. For ten years you have advertised continuously. Your business has shown an annual increase. You are prosperous. This proxperity has come with advertising. You admit that there is a possibility that your advertising. If your advertising has never paid and you continue to succeed, then you will have sufficient proof to warrant the correctness of your opinion, if, on the other hand, you do not succeed, then you will have sufficient proof to warrant the correctness of your opinion, if, on the other hand, you do not succeed, then you will have sufficient proof to warrant the correctness of your opinion, if, on the other hand, you do not succeed, then you will have sufficient proof to warrant the correctness of your opinion, if, on the other hand, you do not succeed, then you will do yourself and your business an injury from which you or your business an injury from which you or your business may never recover. Good, solid, common sense is not in favor of experiments opposed to business custom. Substantially every local merchant who

My friend Blank ran a big retail store in a city of medium size, with extensive local trade and prosperous outlying districts dependent upon the city centre. For full ten years he had been an extensive advertiser, although he was not what I would call an advertising enthusiast. He advertised largely from a sense of duty, as conventionality, (for he was conventionality as well as enterprising), prevented him from discontinuing or outlying his advertising, because others in his tipe his advertising, because others in his public, and known to the public through materially cripple it. Why take such chances? Your concern is known to the public, and known to the public through the newspapers. To withdraw this advertising would certainly create comment. The woman who has been following your advertising will wonder why you have stopped it. She is likely to put but one construction upon your action, and that construction upon your action, and that construction is that your business is not what it was, and for that reason you cannot afford to advertise. Apparent lack of prosperity is almost as bad as real lack of prosperity. The keeping up of appearances, provided you do so legitimately, is as esential as the intrinsic merit back of appearances.

The only thing that I can say to you is what I have said to others like your don't take chances with your business, and when you have found that a certain method pays stick to it. If you have succeeded with advertising, you are likely to meet with greater success with more advertising. Use common sense. Stick to the road over which you have so far successfully traveled until that road becomes crooked, and insurmountable obstacles appear upon it.

### GOOD STORY TOLD ON

#### Cooking School. Free

Free instruction. Free samples. Commencing Monday Morning, January 25th, we open our new cooking school, offering every lady an opportunity to learn the art of scientific cake-baking ABSOLUTELY FREE. We have expert cake bakers from New York at your service. All ladies are invited.

THE NEW CHINA STORE.

Browne & Constine, 205 East St.